SBC6300x

ARM9 Based Single Board Computer

WinCE Development Guide

Version 1.2

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Embest
A Premier Farnell Company

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1.2	20/01/2014	Localisation

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1 Overview

This Manual mainly expounds the burning of WinCE 6.0 system image files of the SBC6300X main board and system customization based on the SBC6300X WinCE 6.0 BSP.

1.1 Terms and definitions

Development Workstation: Development Workstation means X86 PC installed with Windows XP operating system, Microsoft Visual Studio 2005 and Windows Embedded CE 6.0 development environment. This PC must have a serial port and a USB port.

SPI DataFlash: SPI DataFlash means the DataFlash AT45DB321D-SU (4MB) of SPI interface on the SBC6300X main board.

NAND flash: NAND Flash the 8-bit 128MB SAMSUNG K9F1G08UB NAND flash module on the SBC6300X main board.

SDRAM: SDRAM means the extended 64MB SDRAM on the SBC6300X main board, which consists of 2 pieces of 16-bit 32MB HY57V581620FTP-HKOR.

SRAM: SRAM means the 16KB SRAM inside the AT91SAM9263 chip that SBC6300X main board uses.

DNW: The serial port tool running on the development workstation.

2 Introduction to the WinCE 6.0 system

2.1 Image files related to the SBC6300X WinCE 6.0 system

If the WinCE system is customized using the SBC6300X WinCE 6.0 BSP that we provide and the compilation is successfully finished, the system will generate 6 image files, i.e.: `FIRSTBOOT.nb0, EBOOT.nb0, NK.nb0, FIRSTBOOT.bin, EBOOT.bin, NK.bin`, of which 4 files are usually used in burning processes, i.e.: `FIRSTBOOT.nb0, EBOOT.nb0, NK.nb0, NK.bin.` The files generated in .nb0 format will finally be burnt to DataFlash or NAND Flash, and they can directly run in SDRAM; while the files in .bin format must first be converted into .nb0 files by EBOOT running on SBC6300X main board nb0, they are then burnt to DataFlash or NAND Flash.

2.2 Working principles of the SBC6300X WinCE 6.0 system

At present, our SBC6300X WinCE 6.0 BSP supports two booting modes, i.e.: SPI DataFlash and NAND flash. Below is their rough booting flow chart:

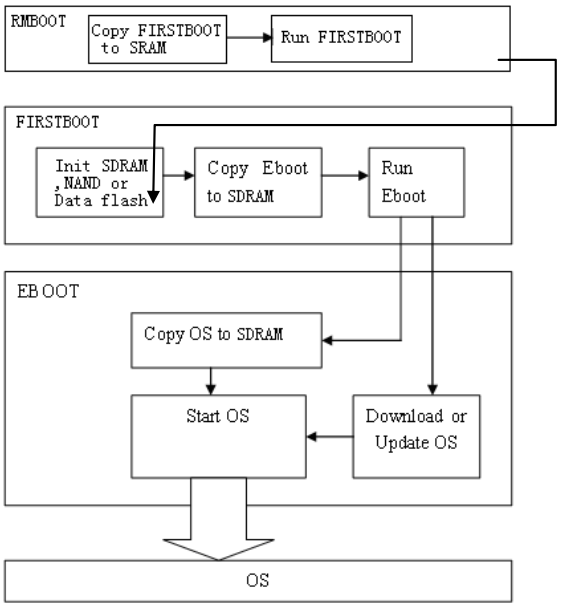


Figure 1: Booting Flowchart

2.2.1 Principles for booting the SBC6300X WinCE 6.0 system from DataFlash

After power on, the system inside the CPU ROMBOOT will automatically copy the FIRSTBOOT image (the first-level user booting code) from the SPI DataFlash 0x00000000 address to the SRAM inside the CPU and execute it. FIRSTBOOT's role is to initialize SDRAM memory, SPI DataFlash, and copy EBOOT, the second-level user booting code from the SPI DataFlash 0x00005000 address to SDRAM on the SBC6300X main board and execute it; FIRSTBOOT also copies the Logo from the SPI DataFlash 0x00100000 address of the SBC6300X main board to SDRAM. In its default state, EBOOT will automatically copy the WinCE system image NK from the NAND flash 0x00200000 address to the SDRAM on the SBC6300X main board, and hand over system control to the operating system. In addition, EBOOT undertakes the management operations of the underlying hardware and shares the data settings with the operating system.

2.2.2 Principles for booting the SBC6300X WinCE 6.0 system from NAND Flash

After power on, the system inside the CPU ROMBOOT will automatically copy the FIRSTBOOT image (the first-level user booting code) from the

SPI NAND flash 0x00000000 address to the SRAM inside the CPU and execute it. FIRSTBOOT's role is to initialize SDRAM memory, SPI NAND , and copy EBOOT, the second-level user booting code from the NAND Flash 0x00020000 address to SDRAM on the SBC6300X main board and execute it; FIRSTBOOT also copies the Logo from the NAND flash 0x00080000 address of the SBC6300X main board to SDRAM. In its default state, EBOOT will automatically copy the WinCE system image NK from the NAND flash 0x00200000 address to the SDRAM on the SBC6300X main board, and hand over system control to the operating system. In addition, EBOOT undertakes the management operations of the underlying hardware and shares the data settings with the operating system.

2.3 The Flash Address of System Image Files

2.3.1 When booted from DataFlash

If you choose to boot from Data flash:

- FIRSTBOOT is located at the beginning of the 0x00000000 address of SPI DataFlash, the capacity of FIRSTBOOT is 4KB;
- EBOOT is located at the beginning of the 0x00005000 address of SPI DataFlash, the capacity of EBOOT is 200KB;
- The Logo is saved at the beginning of the 0x00100000 address of SPI DataFlash;
- WinCE system image files NK is located in NAND flash in an area of 40MB starting from the 0x00200000 address.

The area in NAND flash outside of this 40MB will provide functionality as a NAND flash hard disk under the WinCE system. Therefore, users can customize a WinCE system of no more than 40MB. If you need to store a WinCE system bigger than 40MB or need reduce the NAND flash partition reserved for WinCE system images, please feel free to contact our technicians for assistance.

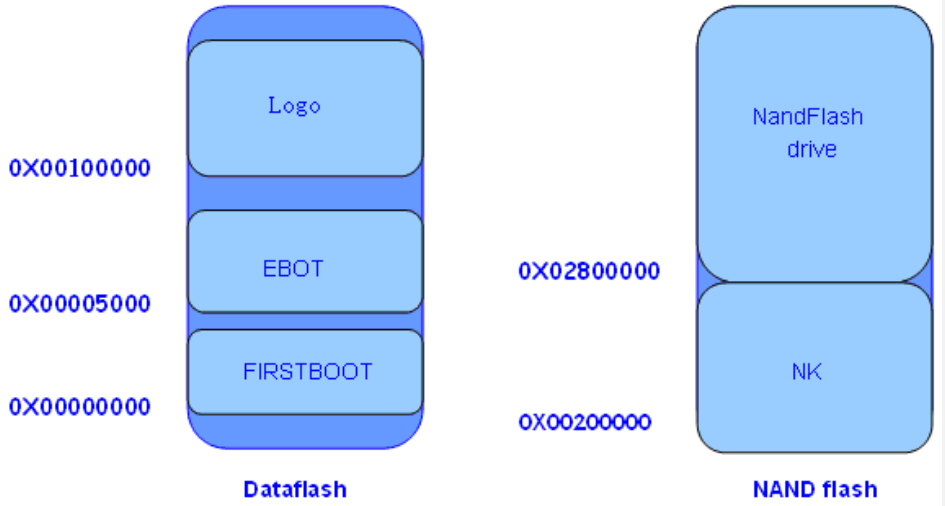


Figure 2: DataFlash Structure

2.3.2 When booted from NAND flash

If you choose to boot from NAND flash:

- FIRSTBOOT is located at the beginning of the 0x00000000 address of the NAND Flash, the capacity of FIRSTBOOT is 4KB;
- EBOOT is located at the beginning of the 0x00020000 address of the NAND flash, the capacity of EBOOT is 200KB;
- The Logo is saved at 0x00080000 of the NAND Flash; WinCE system images are located in NAND Flash in an area of 40MB starting from the 0x00200000 address.

The area in NAND Flash after the 0x2860000 address will provide functionality for use as a NAND Flash hard disk under the WinCE system. Therefore, users can customize a WinCE system of no more than 40MB. If you need store a WinCE system of bigger than 40MB or need reduce the NAND Flash partition reserved for WinCE system images, please feel free to contact our technicians for assistance.

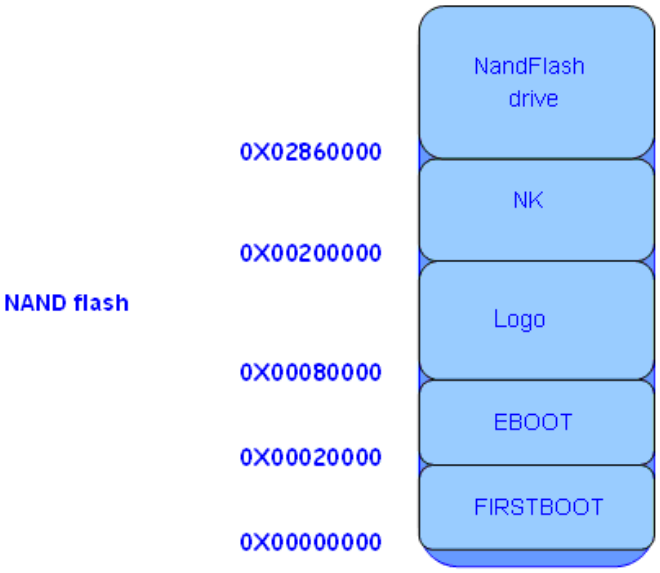


Figure 3: NAND Flash Structure

3 Burning a WinCE System

3.1 Introduction to Burning System Image Files

The SBC6300X WinCE 6.0 BSP supports two burning modes:

1. Burn FIRSTBOOT, EBOOT and WinCE system image NK using the SAM-BA software provided by ATMEL;
2. Connect VS2005 WinCE 6.0 development environment installed on client development workstation or other TFTP servers (e.g.: CEDownload.exe) to the SBC6300X main board, burn WinCE system image files NK via net cable using EBOOT on the SBC6300X (the EBOOT on the SBC6300X WinCE 6.0 BSP doesn't support the burning of user booting codes FIRSTBOOT and EBOOT, it can only burn the WinCE system image file NK.bin).

Note:

🕮 If you use EBOOT as the user booting code on the SBC6300X main board to WinCE system image file NK, the actual process will be, EBOOT, the user booting code on SBC6300X main board will first download WinCE system image file NK.bin that VS2005 WinCE 6.0 generates from TFTP server running on the development workstation to the SDRAM on the SBC6300X main board via Ethernet cable, then the file will be converted into NK.nb0 before being burnt to NAND flash. The TFTP server mentioned here can be the server provided in VS2005 WinCE 6.0 development environment or other TFTP servers. Please note that the port parameter of the TFTP server that you use is 980 instead of 69, the standard TFTP port. The software CEDownload.exe, which we will describe in Section 3.4 below is a TFTP server software, which has changed the default TFTP port from 69 into 980.

3.2 Booting from DataFlash

3.2.1 Install the SAM-BA software

Install the `AT91-ISP v1.12.exe` application (located in `\03 WinCE 6.0 Kit\04 Tools\`) on the SBC6300X CD to your development workstation

with the default path and configuration of the program. After the installation is complete, you will see the SAM-BA v2.8 icon on the desktop:

Figure 4: SAM_BA Icon

3.2.2 Burning a system image using SAM-BA software

1. Make sure the three-way DIP switch is set to the OFF state and make sure there is no SD card in the SD slot of the SBC6300X.
2. Connect the USB device port (J9) of the SBC6300X to the USB Host of the development workstation using the supplied USB cable.
3. Connect the supplied 12V power supply to the J1 port of the SBC6300X main board.
4. Turn on the power switch (SWITCH B1) of the SBC6300X main board; the SBC6300X main board should now be energized.
5. Double click the SAM-BA v2.8 icon as shown below to run the SAM-BA v2.8 program, and select AT91SAM9263-EK and \usb\ARM0 from the menu as shown below.

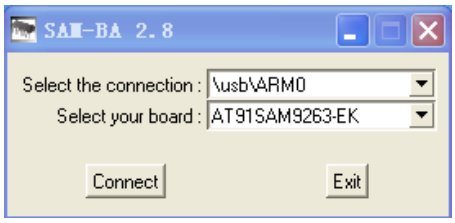


Figure 5: SAM-BA Initialisation

6. Click the Connect button to enter the interface as shown below.

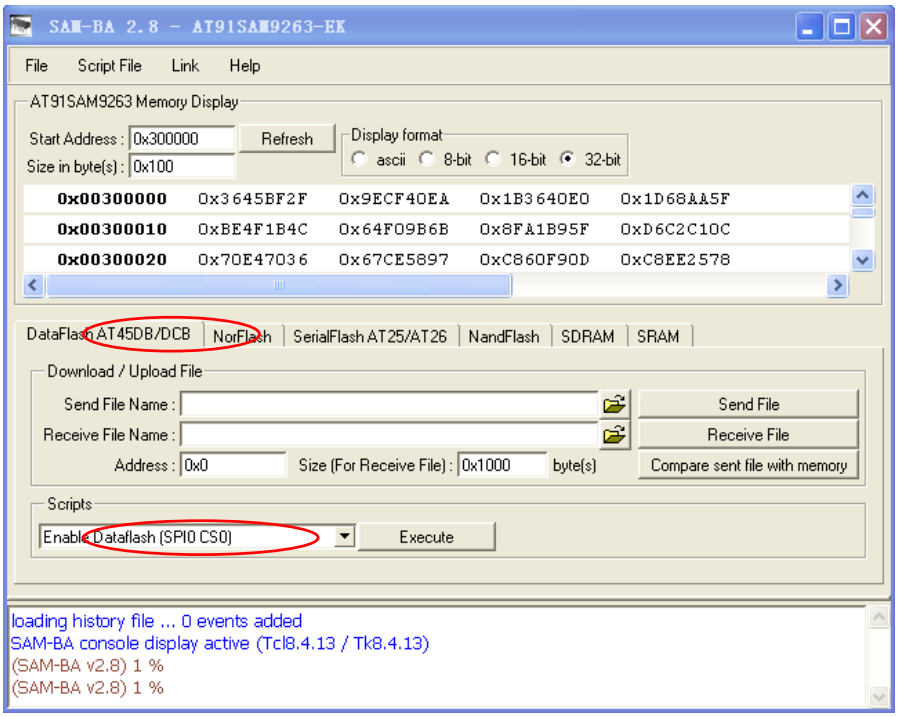


Figure 6: SAM-BA Main Interface

7. Set the boards second and third DIP switches to the ON state then configure the software as shown above (under the DataFlash AT45DB/DCB tab).

8. Select Enable DataFlash (SPI0 CS0) in the Scripts box, and click the Execute button to enable SPI DataFlash on the SBC6300X main board. After this is successful, the SAM-BA interface will resemble the following:

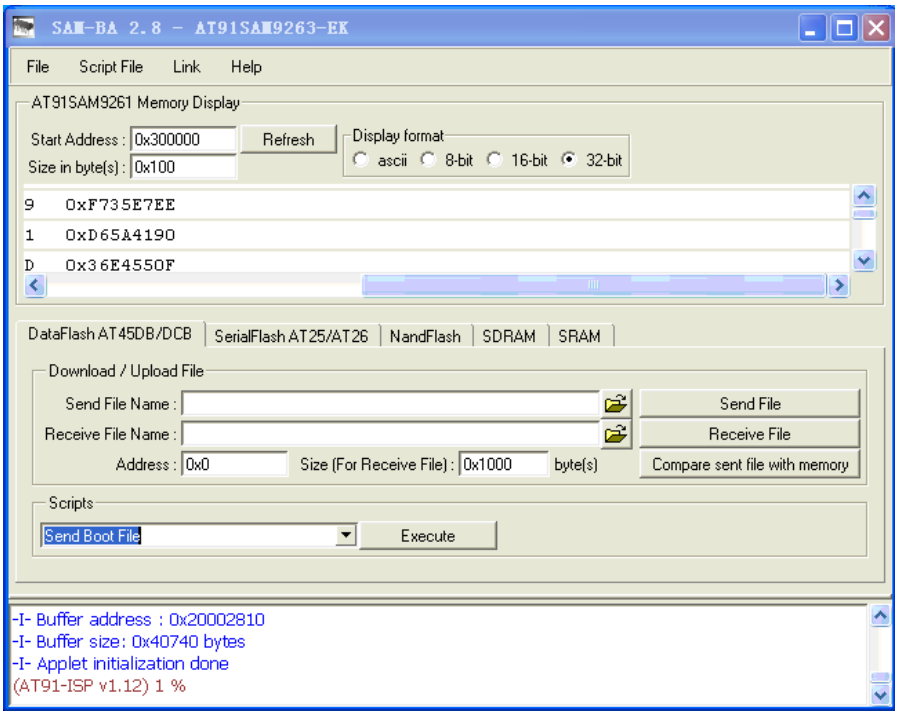


Figure 7: SAM-BA Interface After DataFlash is Enabled

9. As shown above, select Send Boot File in the Scripts menu and click the Execute button. An open file dialog box as shown below will display:

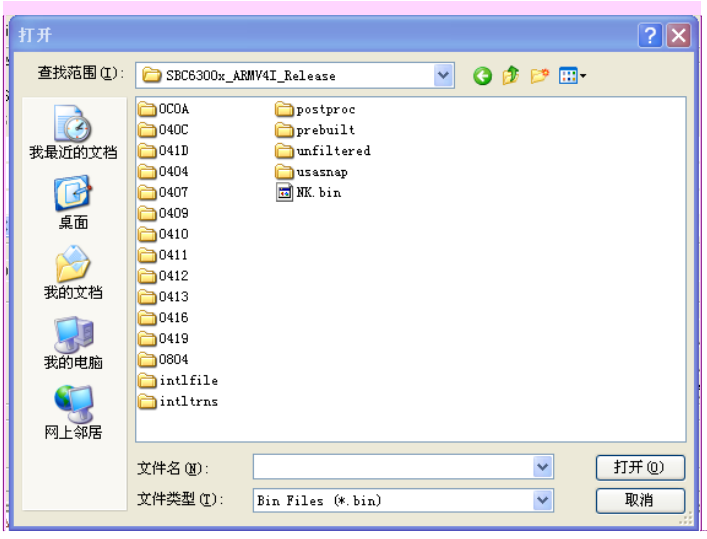


Figure 8: Open File Dialog Box

Comment [ML1]: Chinese

10. As shown below, select the `FIRSTBOOT_SPIDATAFLASH.nb0` file under the directory `\03 WinCE 6.0 Kit\00 Image\` in the SBC6300X CD. In the open file dialog box click the open button, SAM-BA will automatically start burning the `FIRSTBOOT_SPIDATAFLASH.nb0` file to the beginning of the 0x00000000 address of SPI DataFlash on the SBC6300X main board.

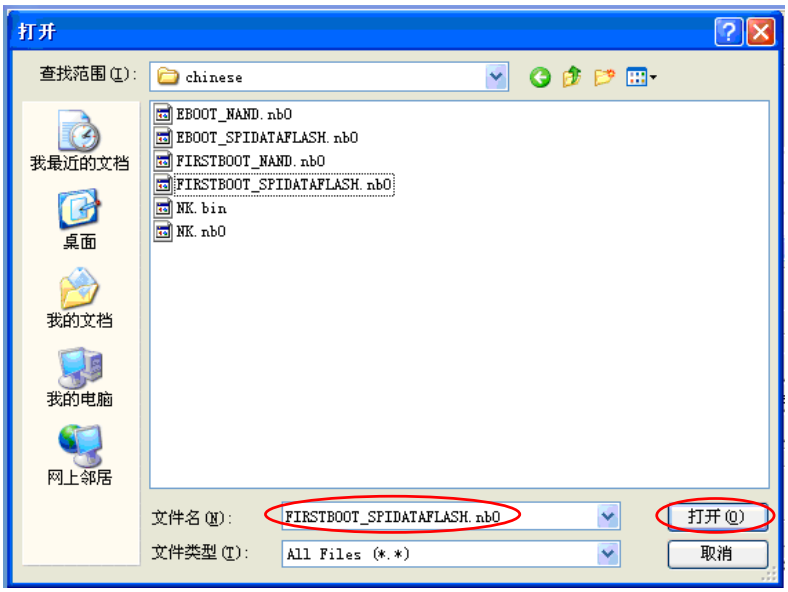


Figure 9: Selecting File

11. After the burning is successful, the window shown below will appear:

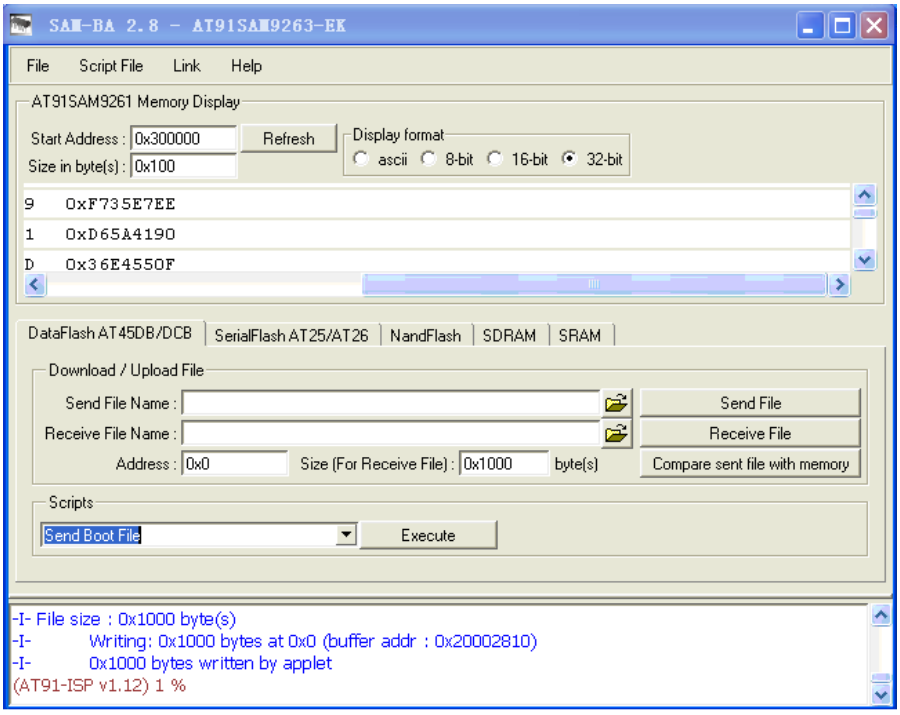


Figure 10: SAM-BA Main Interface

12. Enter the address 0x5000 in the Address field in the Download/Upload File section, select `EBOOT_SPIDATAFLASH.nb0` file under the path `\03 WinCE 6.0 Kit\00 Image\` on the SBC6300X CD in the Send File Name text box. Then click the Send File button in the Download/Upload File area, the software will automatically start burning `EBOOT_SPIDATAFLASH.nb0` file to the beginning of the 0x00005000 address of SPI DataFlash on the SBC6300X main board.

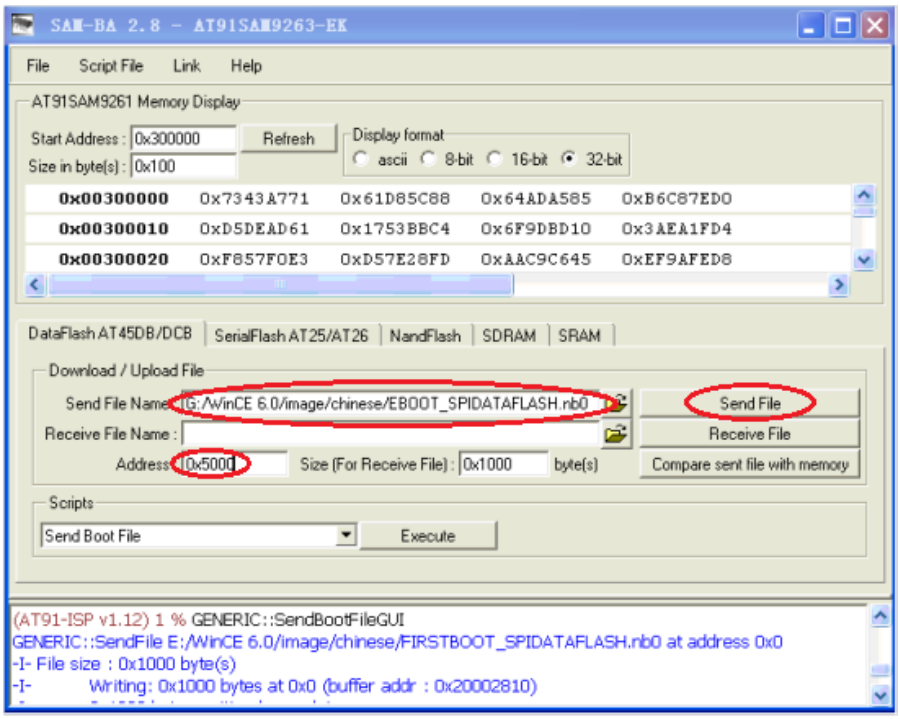


Figure 11: Information to be Entered into SAM-BA

13. After the burning is successful, the interface as shown below will appear:

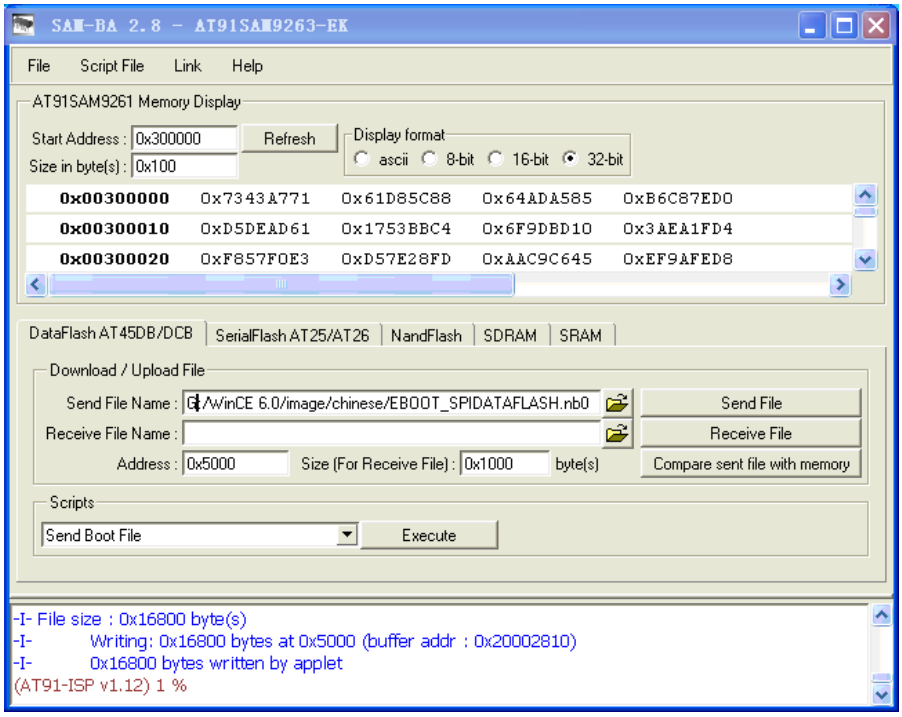


Figure 12: Burning Successful

14. As shown below, enter the address 0x100000 in the Address field in the Download/Upload File area, select the Logo.bin file under the path `\03 WinCE 6.0 Kit\00 Image\` on the SBC6300X CD in the Send File Name text box. Then click the Send File button in the Download/Upload File area. The software will automatically start burning the Logo.bin file to the beginning of the 0x00100000 address of SPI DataFlash on the SBC6300X main board.

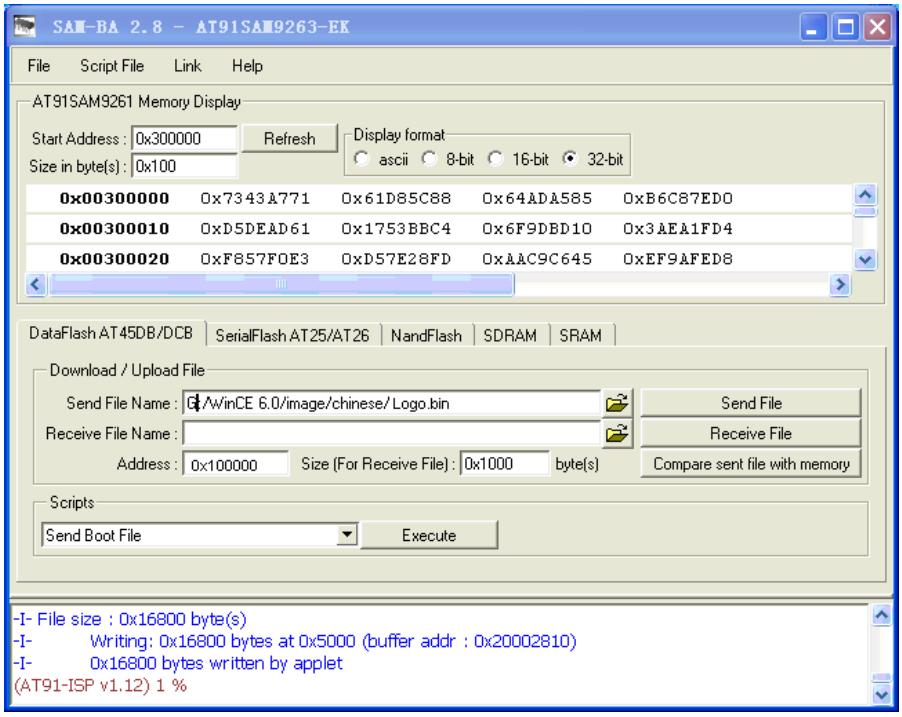


Figure 13: SAM-BA Logo Settings

15. As shown below, select the NAND Flash tab. In the Scripts menu select Enable NAND Flash, and click the Execute button to enable NAND Flash on the SBC6300X main board.

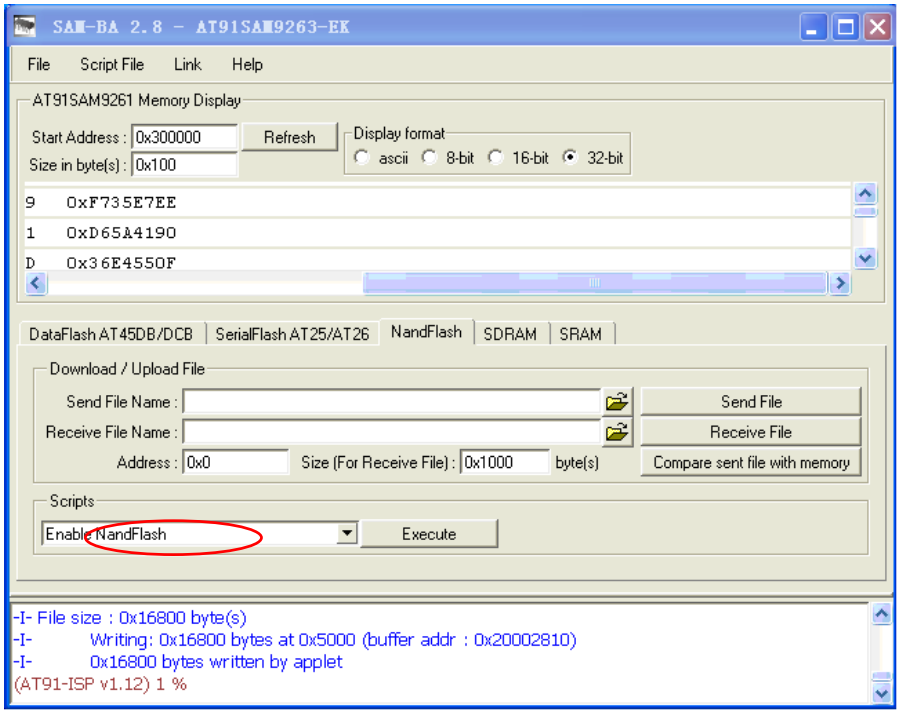


Figure 14: Enabling NAND Flash

16. After the enabling operation is successful, the interface as shown below will appear:

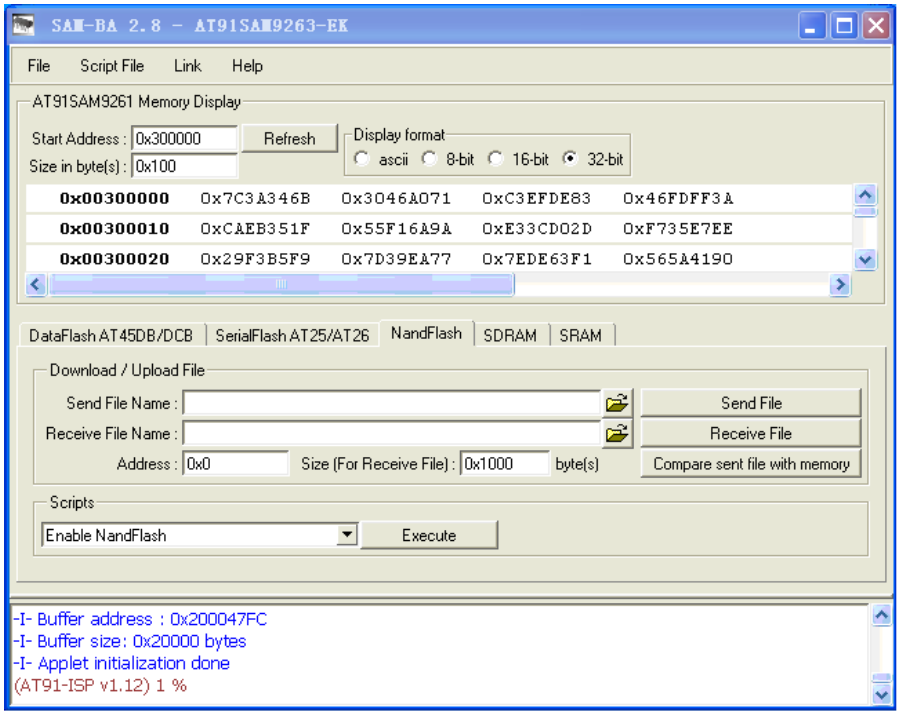


Figure 15: Operation Successful

17. Select the `SBC6300X CD \03 WinCE 6.0 Kit\00 Image \NK.nb0` file in the Send File Name area, then click the Send File button in the Download/Upload File section. The software will start burning the `NK.nb0` file to the beginning of the 0x00200000 address of the NAND Flash on the SBC6300X main board.

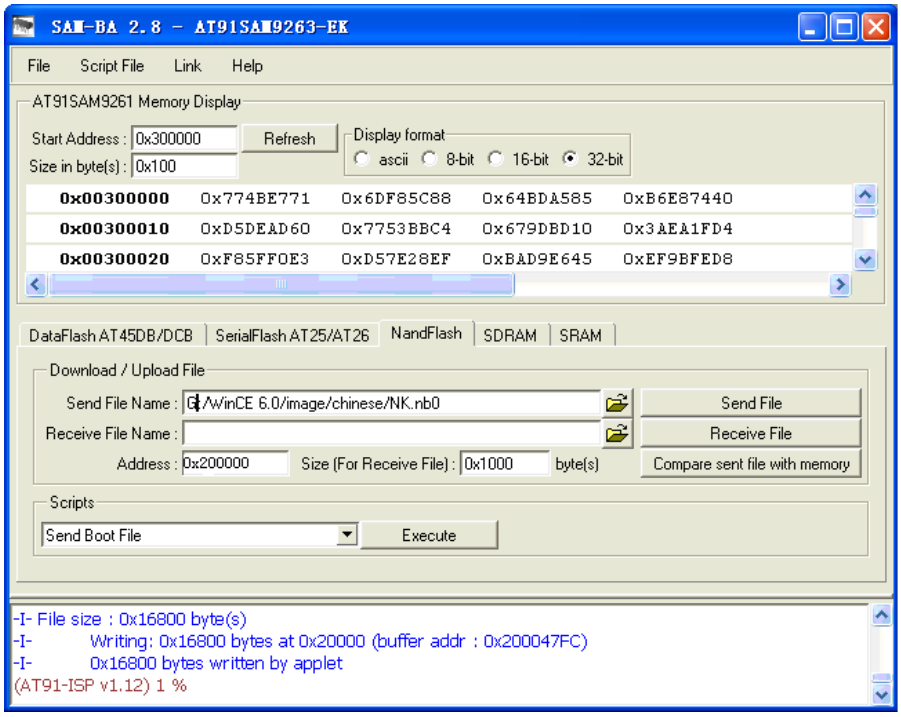


Figure 16: SAM-BA NK.nb0 Settings

18. After the burning is successful, the interface (below) will appear. It takes 3-10 minutes to burn the NK.nb0 file.

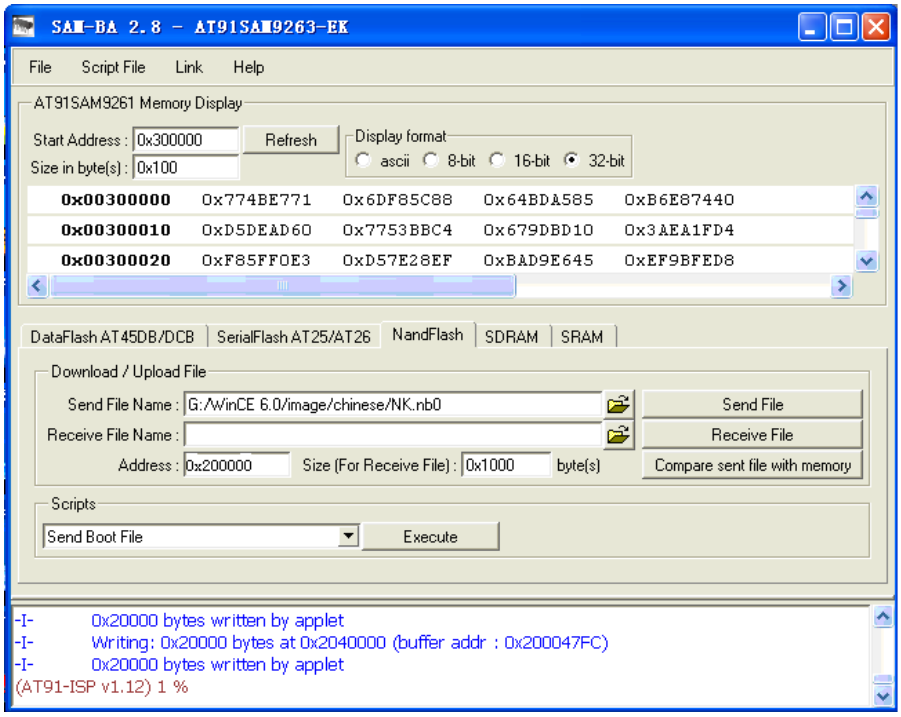


Figure 17: Burning was Successful

3.3 Booting from NAND Flash

3.3.1 Burn SBC6300X system image through SAM-BA software

1. For installation of the SAM-BA software please refer to Section 3.2.1 , and finish steps 1-6 referring to Section 3.2.2.

2. Set the core board second DIP switch to the ON state. Then as shown below, select the NAND Flash tab in the software window.

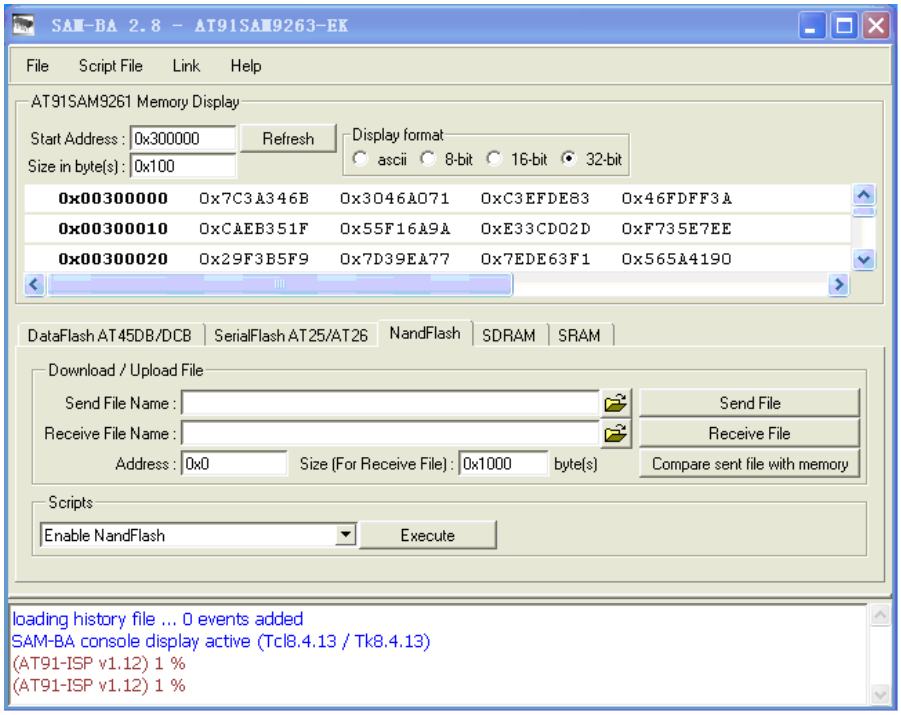


Figure 18: SAM-BA NAND Flash Tab

3. In the Scripts menu, select Enable NAND Flash, and click the nearby Execute button to enable NAND flash on the SBC6300X main board. After the Enable operation is successful, the following interface will appear:

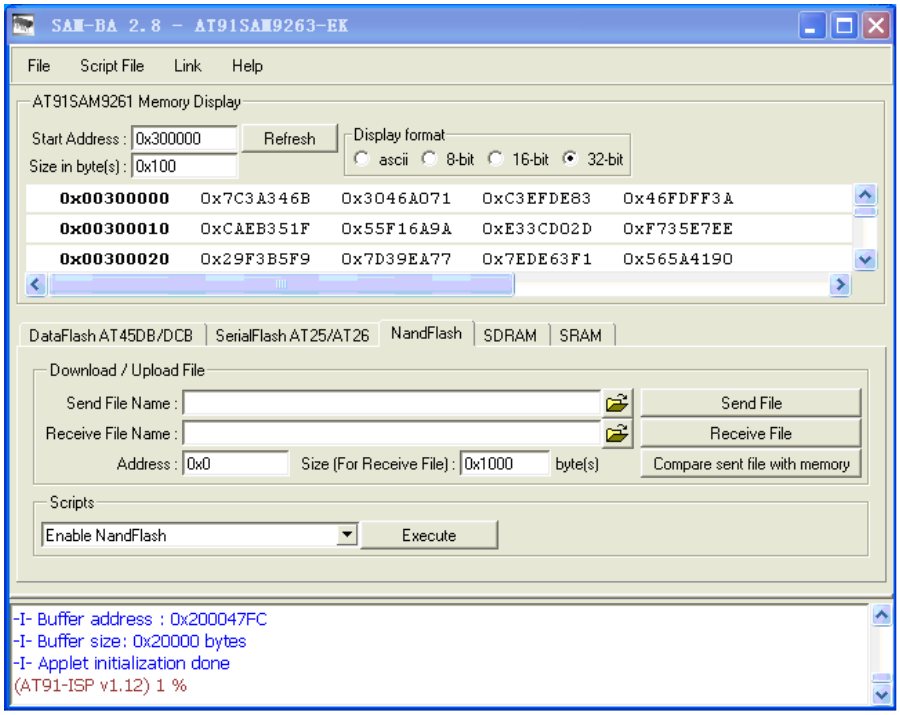


Figure 19: NAND Flash Enabled

4. As shown below in the Scripts menu, select Erase All and click the Execute button; the software will automatically erase the entire NAND flash.

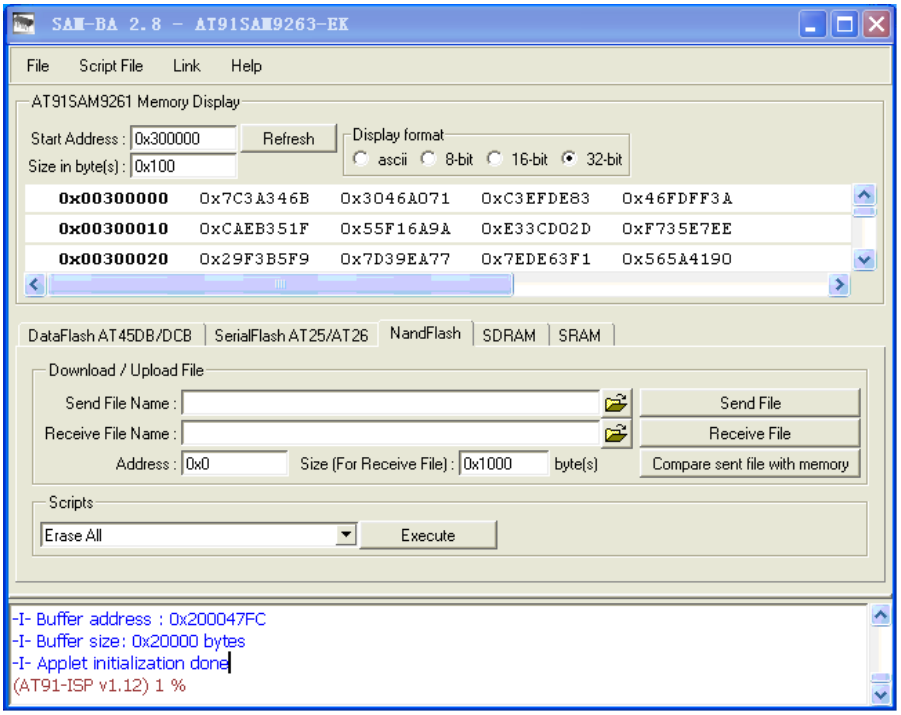


Figure 20: Erasing NAND Flash

5. After the erasing operation is successful, the interface as shown in below will appear:

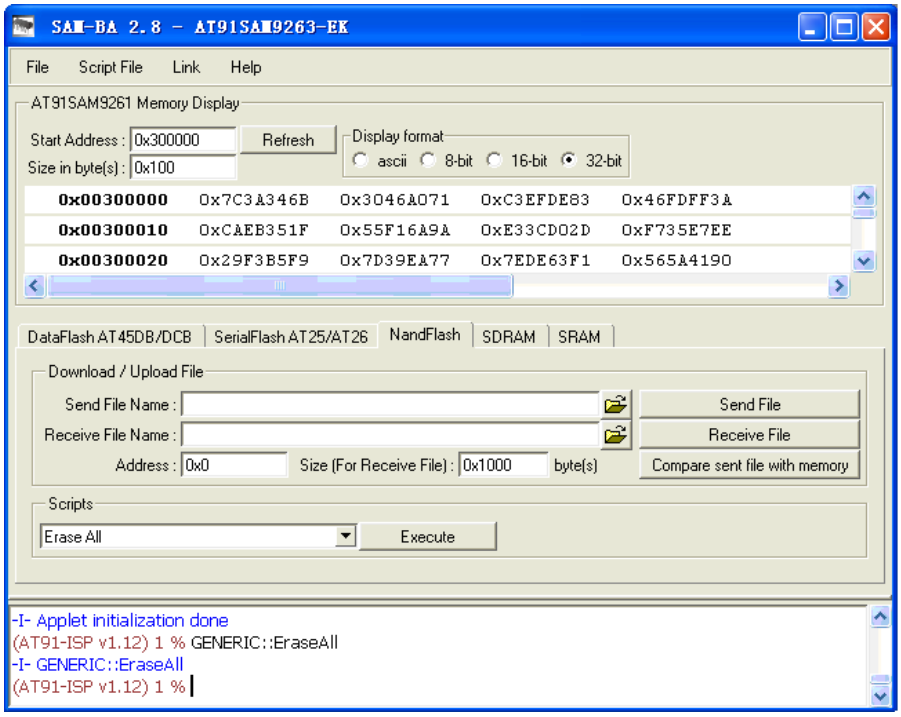


Figure 21: NAND Flash Erased

6. Select the Send Boot File button in the Scripts menu and click the Execute button. An open file dialog box as shown below will appear.

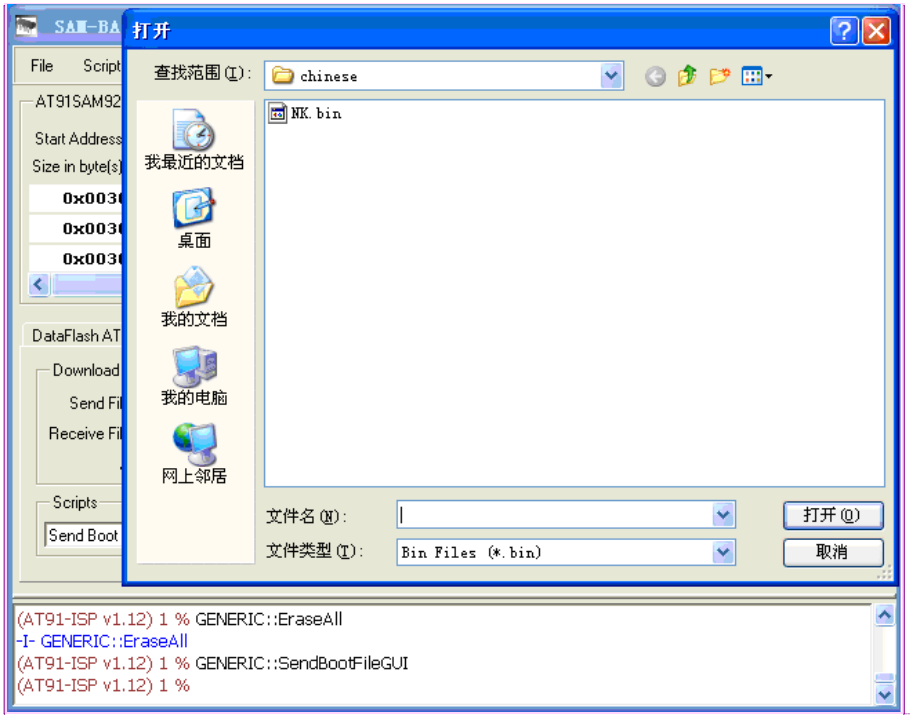


Figure 22: Open File Dialog Box

Comment [ML2]: Chinese

7. As shown below, select the `FIRSTBOOT_NAND.nb0` file under the path `\03 WinCE 6.0 Kit\00 Image\` on the SBC6300X CD in the open file dialog box, then click the Open button. The software will automatically start burning the `FIRSTBOOT_NAND.nb0` file to the beginning of the 0x00000000 address of the NAND Flash on the SBC6300X main board.

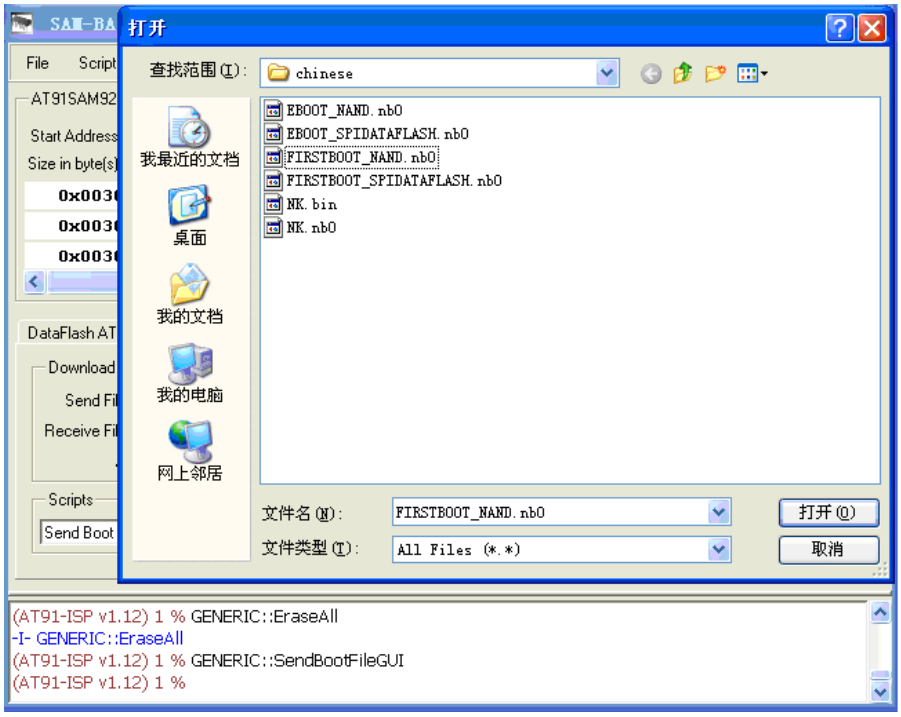


Figure 23: File Selection

8. After the burning is successful, the interface (below) will appear.

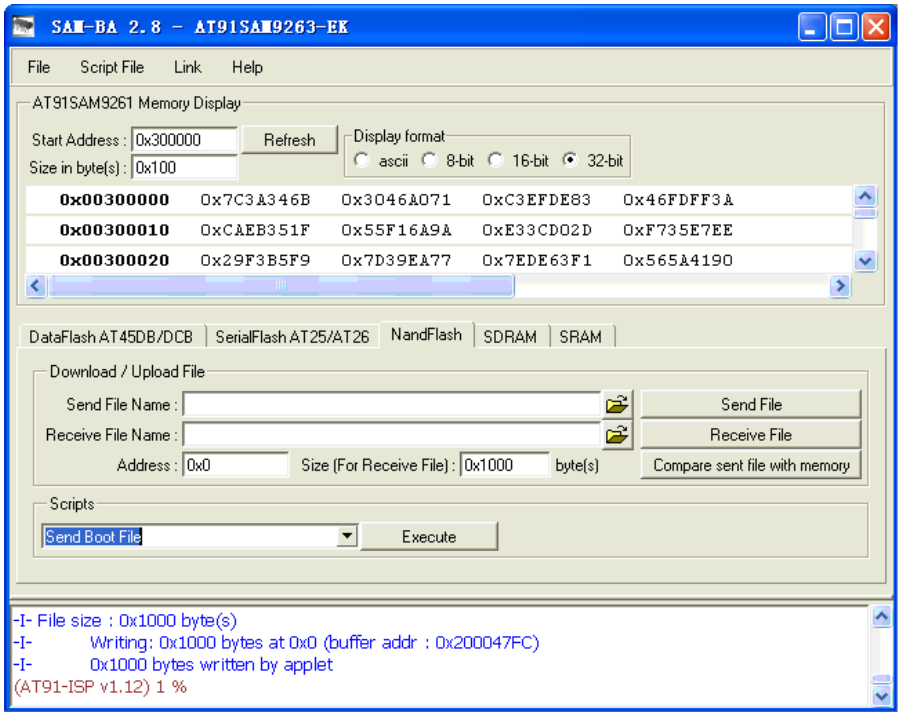


Figure 24: Burning Successful

9. As shown in the following image, enter the address 0x20000 in the Address: field. Select the `SBC6300X CD \03 WinCE 6.0 Kit\00 Image \EBOOT_NAND.nb0` file in the text box Send File Name:, then click the Send File button. The software will start burning the EBOOT_NAND.nb0 file to the beginning of the 0x20000 address of the NAND Flash on the SBC6300X main board.

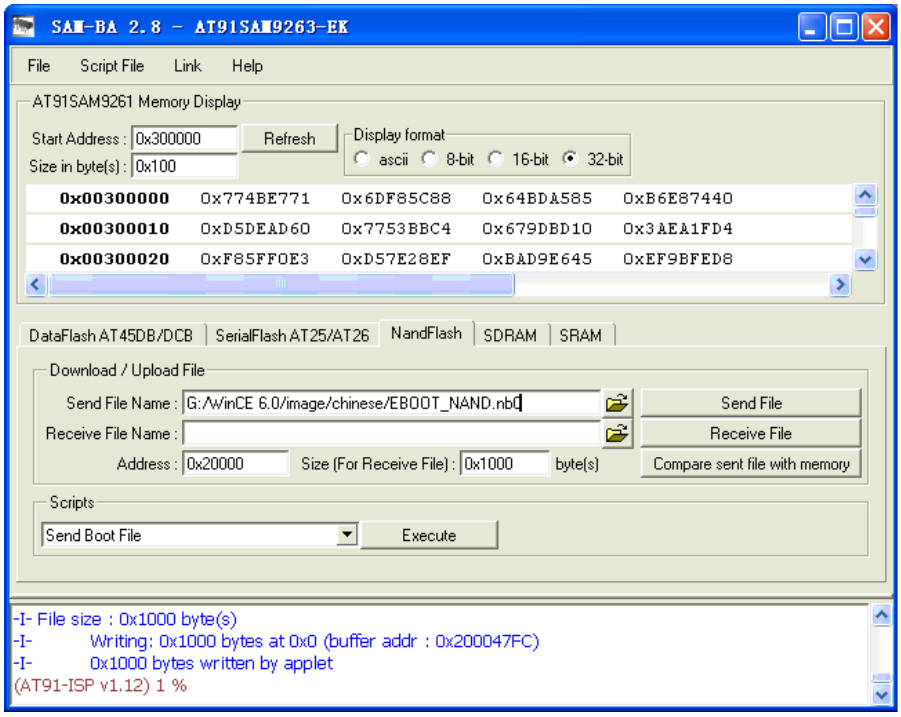


Figure 25: Burning EBOOT_NAND.nb0

10. After the burning is successful, the following interface will appear.

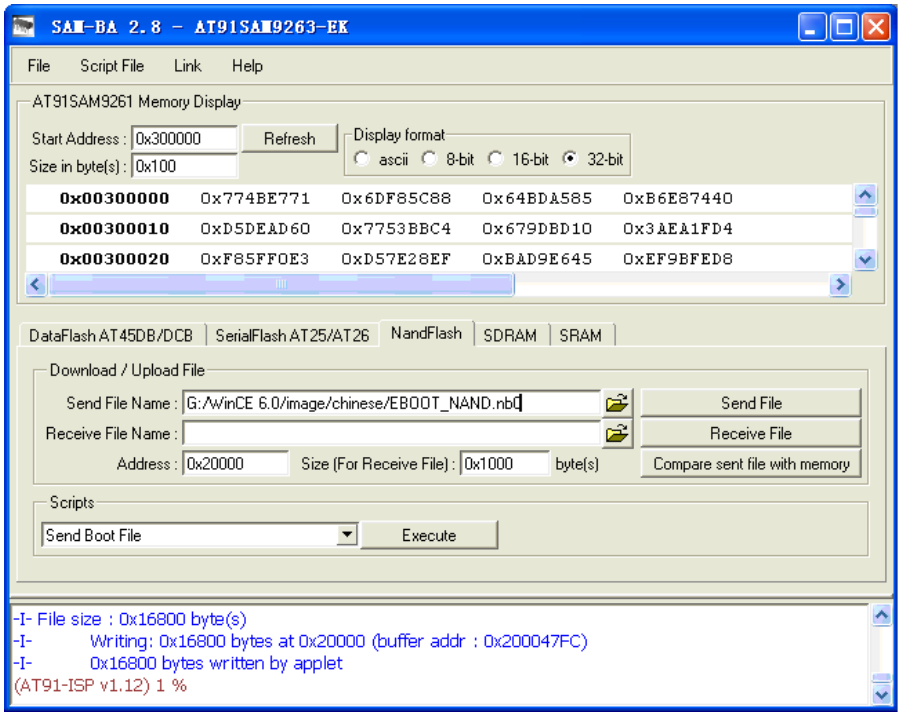


Figure 26: Burning Successful

11. As shown below, enter the address 0x80000 in the Address field. Select the `SBC6300X CD \03 WinCE 6.0 Kit\00 Image \Logo.bin` file in the Send File Name box, then click the Send File button. The software will start burning the Logo.bin file to the beginning of the 0x80000 address of the NAND flash on the SBC6300X main board.

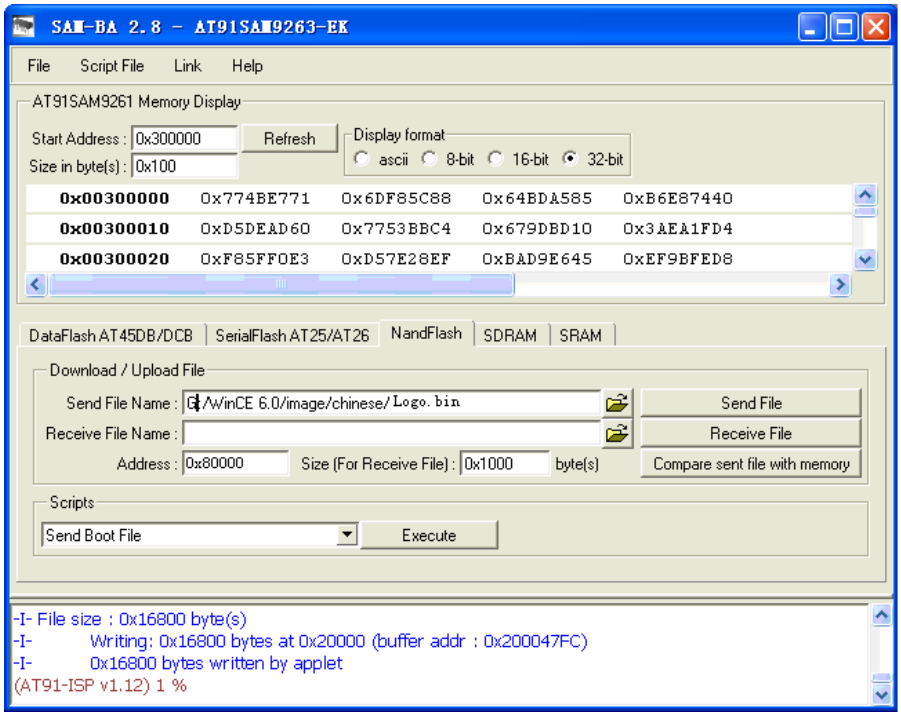


Figure 27: Burning Logo.bin

12. As shown below, enter 0x00200000 in the address field in the software window; select the file `\03 WinCE 6.0 Kit\00 Image \NK.nb0` (on the CD) in the Send File Name box, then click the Send File button. The software will start burning the NK.nb0 file to the beginning of the 0x00200000 address of the NAND Flash on the SBC6300X main board.

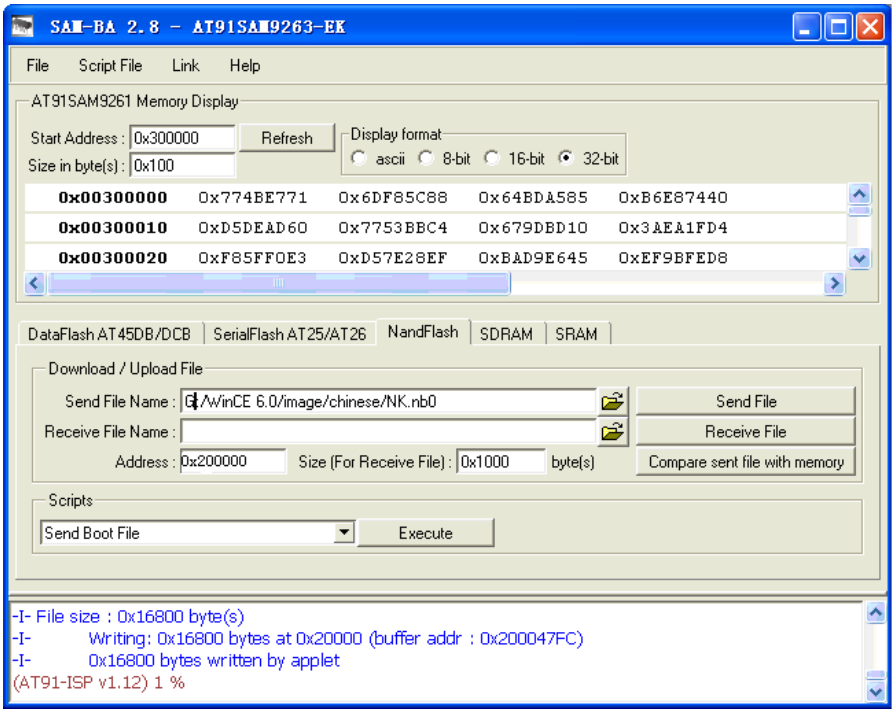


Figure 28: Burning NK.nb0

13. After the burning is successful, the following interface will appear. It takes 3-10 minutes to burn the NK.nb0 file.

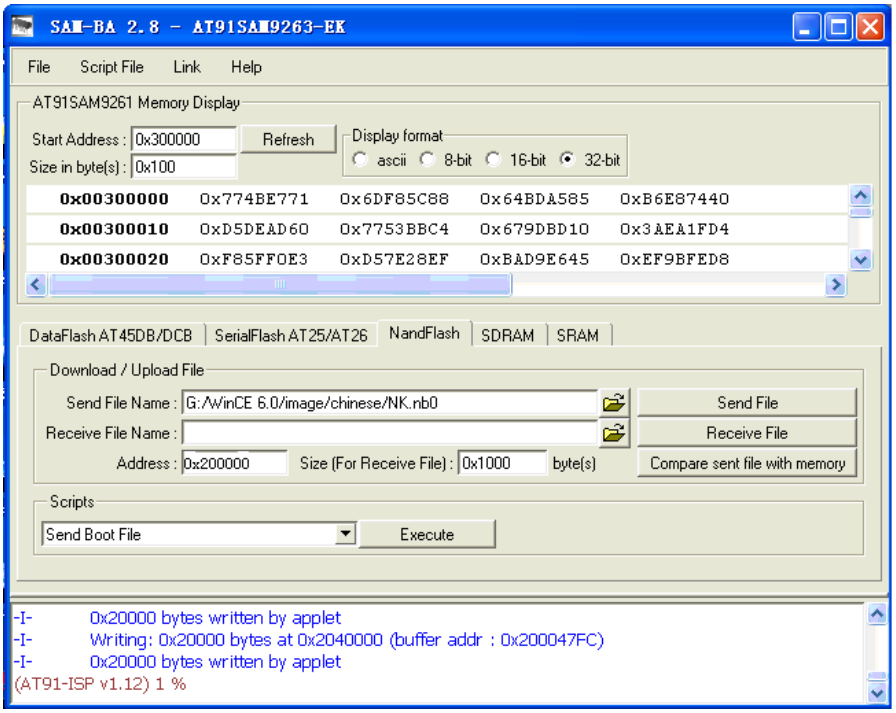
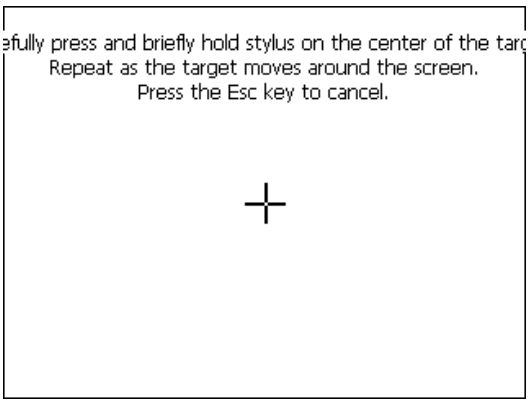


Figure 29: Burning Successful

4 Booting the WinCE 6.0 system

1. Refer to section 3; select the option to boot from DataFlash or NAND flash then burn the WinCE 6.0 system image files.

2. Set the power SWITCH to the ON state, the WinCE system will be booted. Enter the WinCE 6.0 system, the TFTLCD will first display the calibration touch screen as shown below.


efully press and briefly hold stylus on the center of the tarc
Repeat as the target moves around the screen.
Press the Esc key to cancel.

5 System Customization Based on the WinCE 6.0 BSP

Note:

📖 To develop a Windows Embedded CE 6.0 operating system using the SBC6300X BSP, you need setup a Windows Embedded CE 6.0 development workstation. This Manual assumes that the Windows Embedded CE 6.0 development workstation software has been installed on Drive F, e.g. the installation path for Windows Embedded CE 6.0 is [F:\WINCE600].

5.1 Installation of the WinCE 6.0 BSP

Unzip the archive located in: `SBC6300X CD\03WinCE6.0Kit\01BSP\SBC6300X.rar` to the `F:\WINCE600\PLATFORM` folder of the development workstation. Unzip the archive located in: `SBC6300X CD\03WinCE6.0Kit\01BSP\ATMEL.rar` to the location: `F:\WINCE600\PLATFORM\COMMON\SRC\SOC` on the development workstation. Once this is complete, the installation of SBC6300X WinCE 6.0BSP is finished.

Compilation of a WinCE system based on the SBC6300X WinCE 6.0 BSP

Here we will not describe how to customize a WinCE project based on the BSP in a VS2005 WinCE 6.0 development environment, the user can directly copy the `SBC6300X CD\03WinCE6.0Kit\02Project\SBC6300X.rar` archive to the directory `F:\WINCE600\OSDesigns\` on the development workstation, and unzip this file into the same directory. The user can then directly open the project file `SBC6300X.sln` (in the `F:\WINCE600\OSDesigns\SBC6300X folder`), and select (Build-> Build Solution) in VS2005 to start compiling the customized WinCE system.

Customisation of a WinCE system based on the SBC6300X WinCE 6.0 BSP

This section will describe how to customize WinCE 6.0 in the SBC6300X BSP:

1. Open Visual Studio 2005 and click File->New->Project, as below:

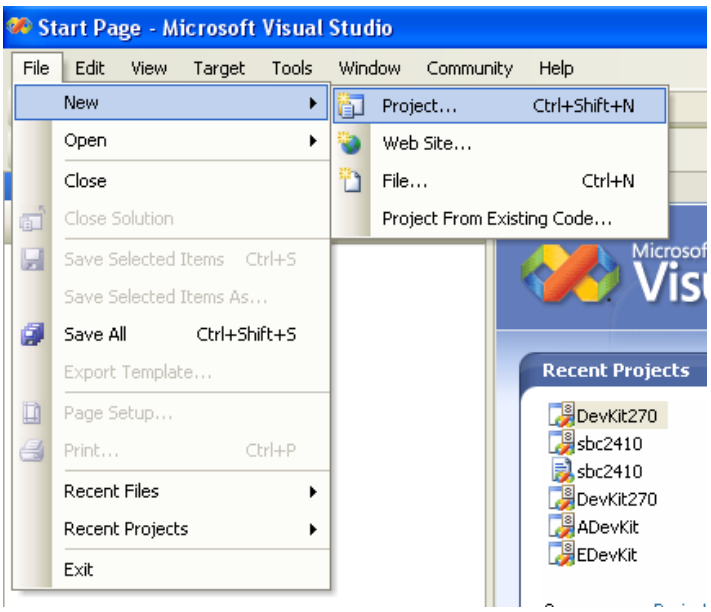


Figure 30: Starting a New Project

2. Select Platform Builder for CE 6.0 from Other project types in New Project wizard, enter SBC6300X as the name, (see below)

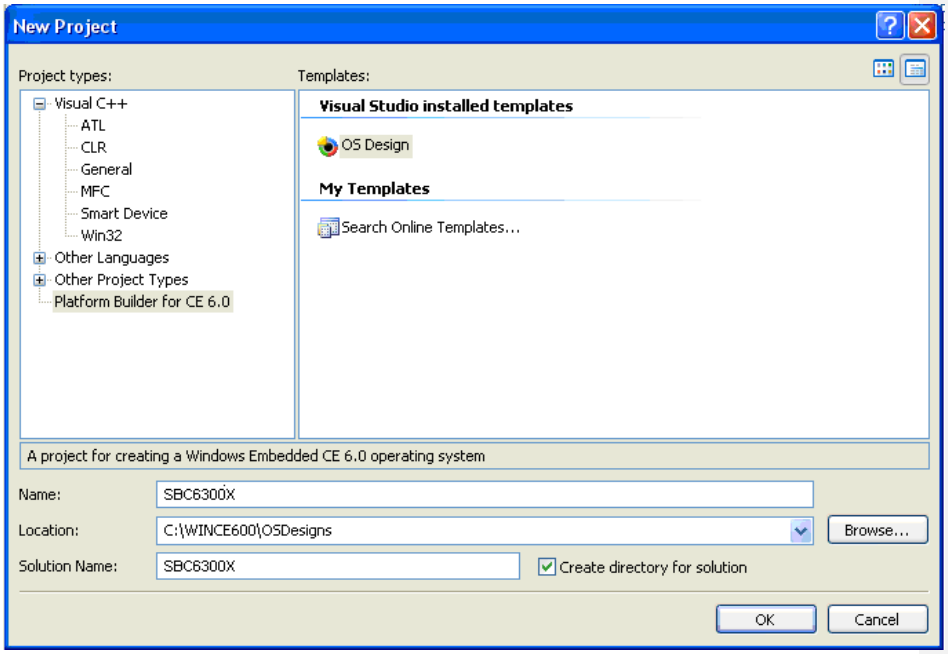


Figure 31: Enter Project Name

3. Click the OK button, the system will progress to the next step of the Windows Embedded CE 6.0 OS Design Wizard.

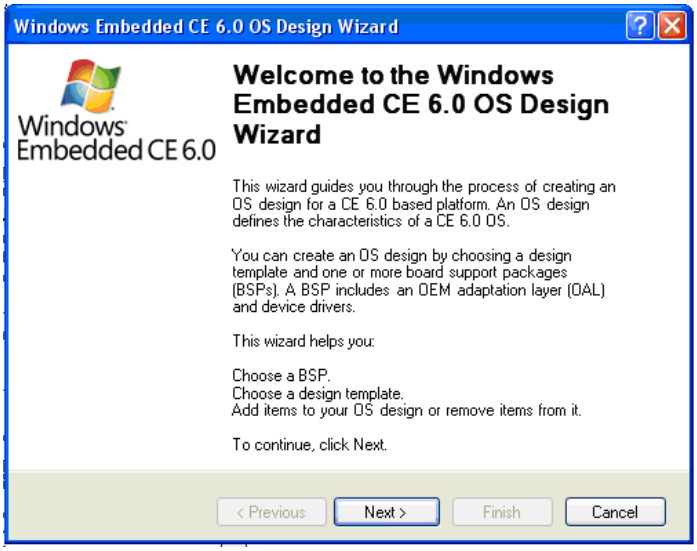

Windows Embedded CE 6.0 OS Design Wizard
Windows Embedded CE 6.0
Welcome to the Windows Embedded CE 6.0 OS Design Wizard
This wizard guides you through the process of creating an OS design for a CE 6.0 based platform. An OS design defines the characteristics of a CE 6.0 OS.
You can create an OS design by choosing a design template and one or more board support packages (BSPs). A BSP includes an OEM adaptation layer (OAL) and device drivers.
This wizard helps you:
Choose a BSP.
Choose a design template.
Add items to your OS design or remove items from it.
To continue, click Next.
< Previous
Next >
Finish
Cancel

Figure 32: OS Design Wizard

4. Click the Next button and select SBC6300X:ARMV4I in Board Support Packages (BSPs):

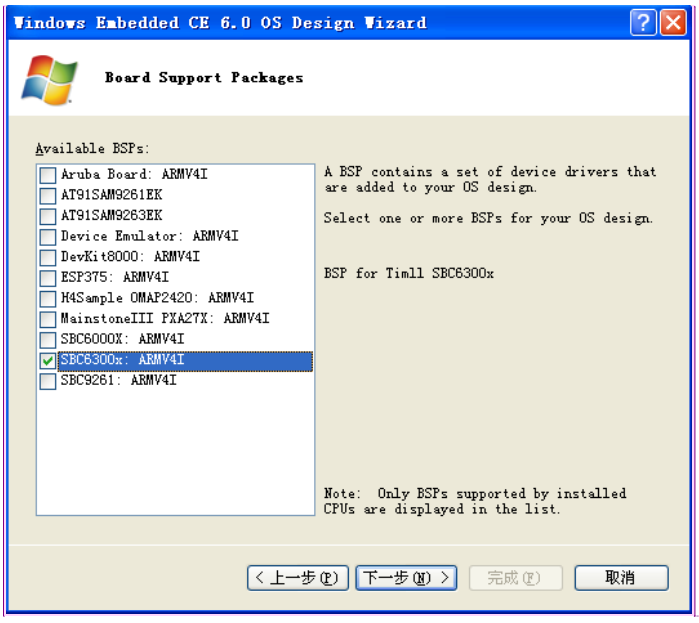


Figure 33: Select BSP

Comment [ML3]: Chinese

5. Click the Next button and select PDA Device in the newly opened Design Templates window:

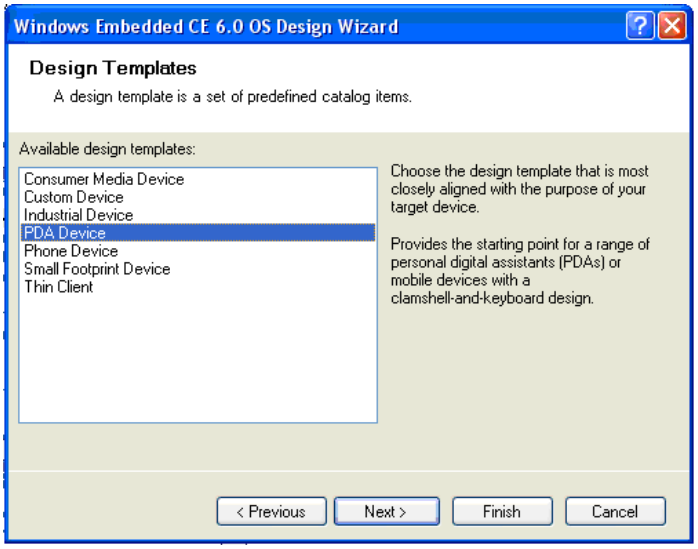

Windows Embedded CE 6.0 OS Design Wizard
Design Templates
A design template is a set of predefined catalog items.
Available design templates:
Consumer Media Device
Custom Device
Industrial Device
PDA Device
Phone Device
Small Footprint Device
Thin Client
Choose the design template that is most closely aligned with the purpose of your target device.
Provides the starting point for a range of personal digital assistants (PDAs) or mobile devices with a clamshell-and-keyboard design.
< Previous
Next >
Finish
Cancel

Figure 34: Select Design Template

6. Click Next and select Mobile Handheld:

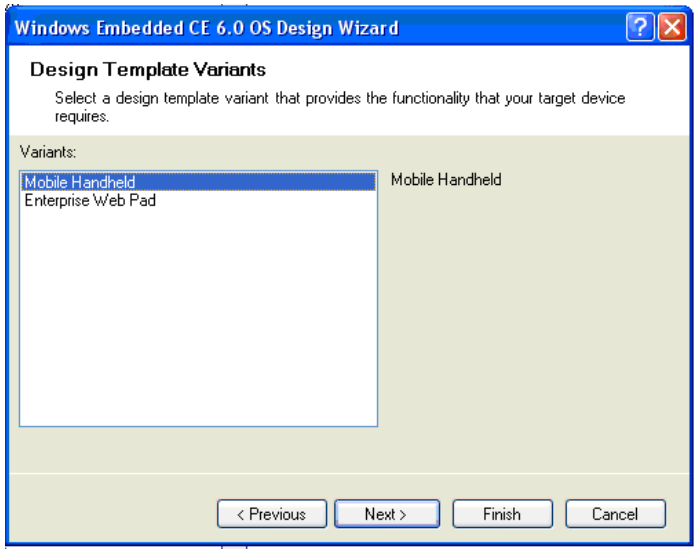


Figure 35: Select Design Template Variant

7. Click Next to open the Applications & Media window, add Internet Explorer 6.0 (under the Internet Browser checkbox) and WordPad in addition to the preselected default options:

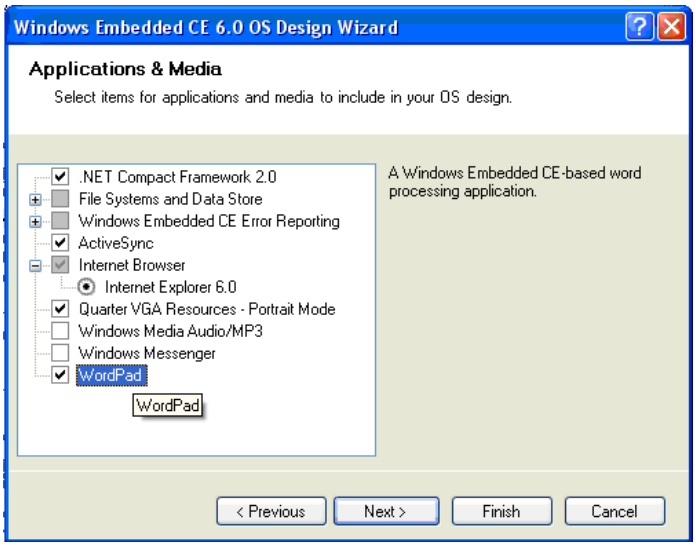


Figure 36: Add IE 6 and WordPad

8. Click the Next button to open Networking & Communications, remove Personal Area Network(PAN)->Bluetooth and Personal Area Network(PAN)->IraDA from the existing default options.

Windows Embedded CE 6.0 OS Design Wizard
Windows Embedded CE 6.0
Welcome to the Windows Embedded CE 6.0 OS Design Wizard
This wizard guides you through the process of creating an OS design for a CE 6.0 based platform. An OS design defines the characteristics of a CE 6.0 OS.
You can create an OS design by choosing a design template and one or more board support packages (BSPs). A BSP includes an OEM adaptation layer (OAL) and device drivers.
This wizard helps you:
Choose a BSP.
Choose a design template.
Add items to your OS design or remove items from it.
To continue, click Next.
< Previous
Next >
Finish
Cancel

Figure 37: OS Design Wizard

9. Click the Next button, then click finish in the OS Design Project Wizard Complete window shown below:

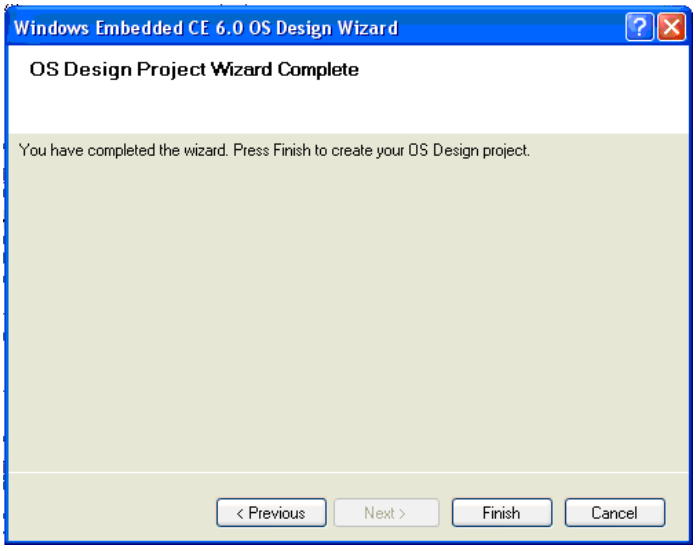

Windows Embedded CE 6.0 OS Design Wizard
OS Design Project Wizard Complete
You have completed the wizard. Press Finish to create your OS Design project.
< Previous
Next >
Finish
Cancel

Figure 38: Wizard Complete

10. Click Acknowledge to finish the initial customization of the WinCE 6.0 OS.

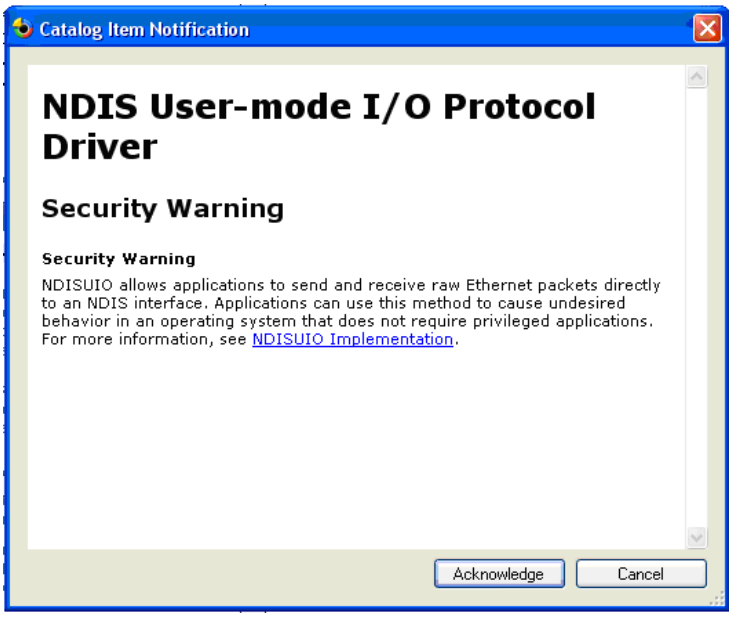

Catalog Item Notification
NDIS User-mode I/O Protocol Driver
Security Warning
Security Warning
NDISUIO allows applications to send and receive raw Ethernet packets directly to an NDIS interface. Applications can use this method to cause undesired behavior in an operating system that does not require privileged applications. For more information, see NDISUIO Implementation.
Acknowledge
Cancel

Figure 39: I/O Protocol Driver Security Warning

11. Tick the following options under `View->other windows->Catalog Items View->SBC6300X->Core OS->CEBASE->Core OS Services->USB HOST Support` in the Catalog Items window.

```
USB Function Driver
USB Host Support
USB Human Input Device (HID) Class Driver->USB HID Keyborad and Mouse
USB Storage Class Driver
```

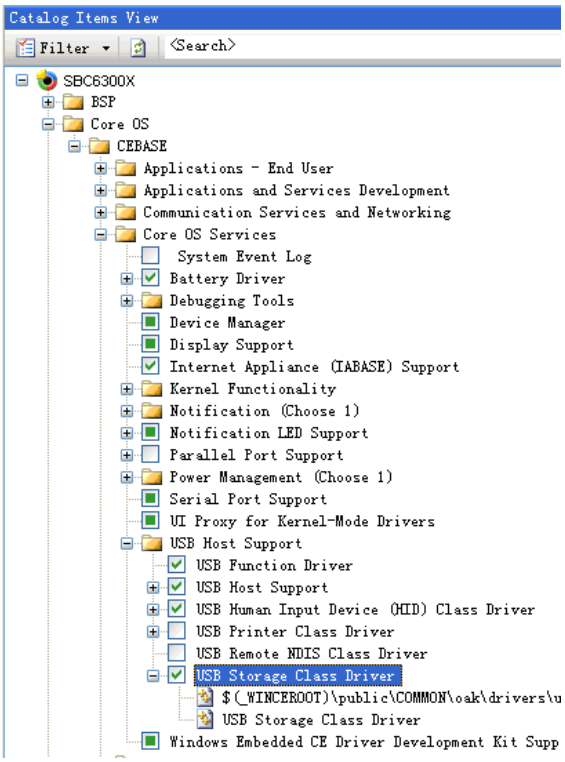


Figure 40: Adding USB Host Support

12. Add the following options following the steps described above:

```
Core OS->CEBASE -> Communication Services and Networking->Networking-General->
Domain Discovery
Core OS->CEBASE -> Communication Services and Networking->Networking-General->
Extended DNS Querying and Update(DNSAPI)
```

Here we remove the existing default options:

```
Core OS->CEBASE -> Communication Services and Networking ->Networking-General->
```

```
TCP/IPv6 Support
```

Continue to add the following options:

```
Core OS->CEBASE->File Systems and Data Store->Storage Manager->Storage
Manager Control Panel Applet
Core OS->CEBASE->International->Locale Specific Support-> Chinese
(Simplified) ->Fonts->SimSun&NsimSun(Choose 1)->SimSun&NsimSun
Core OS->CEBASE->International->Locale Specific Support-> Chinese
(Simplified) ->GB1803030 Data Converter-
Core OS->CEBASE->International->Locale Specific Support-> Chinese
(Simplified) -> Monotype Imaging AC3 Font Compression
Device Drivers->SDIO->SDIO Host->SDIO Standard Host Controller
Device Drivers->SDIO->SDIO Memory->SD Memory
Device Drivers->USB Function->USB Function Clients->Mass Storage
Device Drivers->USB Function->USB Function Clients->serial
```

13. Set compilation type as SBC6300X ARMV4I Release:

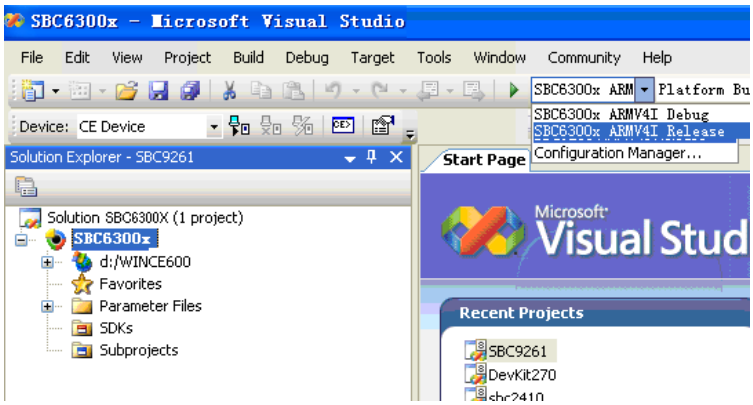


Figure 41: Setting Compilation Type

14. Click `Project->properties` in VS2005:

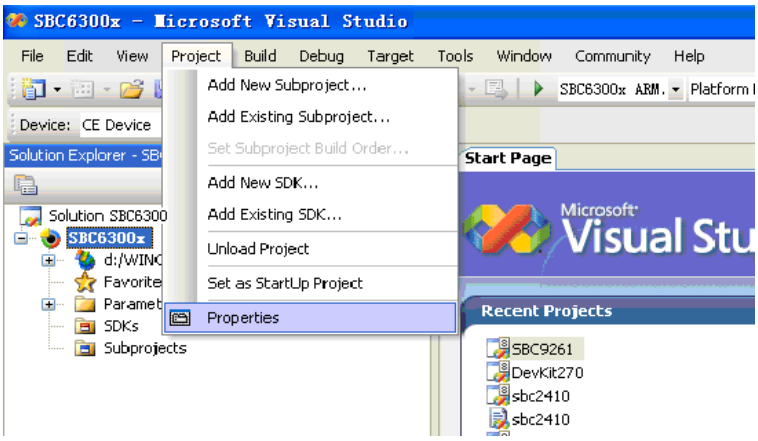


Figure 42: Open Properties

15. Tick Enable eboot space in memory (IMAGE=1) in Build Options, as below, click OK to finish editing the compilation settings.

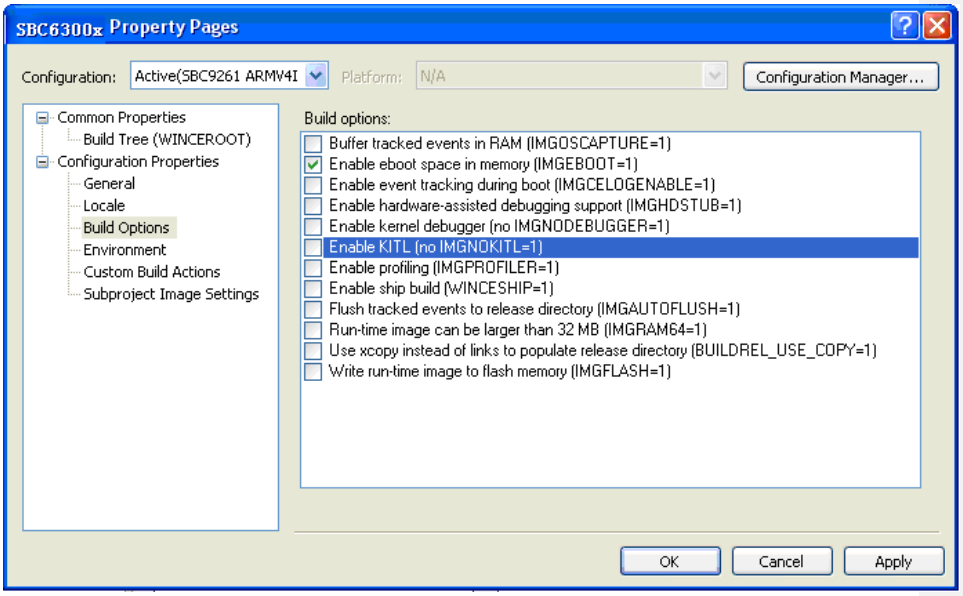


Figure 43: Enable EBOOT Space in Memory

16. Tick the driver of the module you need SBC6300X main board, in `View->Other window->Catalog Items View->SBC6300X->Third Party->SBC6300X:ARMV4I` in VS2005.

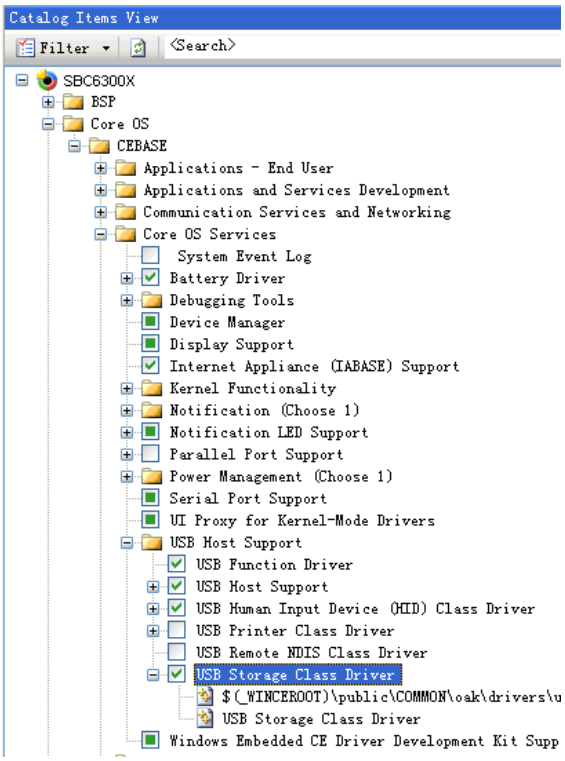


Figure 44: Select USB Storage Class Driver

17. Click `Build->Advanced Build Commands->Sysgen` in VS2005 to start compiling:

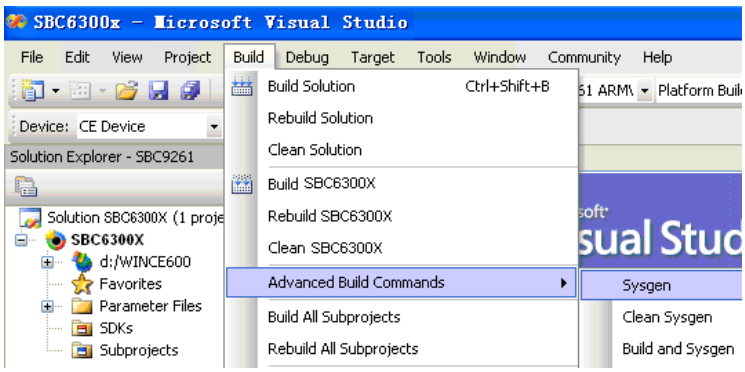


Figure 45: Start Compiling

18. As the compilation may take a long time (depends on the hardware of the development workstation), please wait. After

the system compilation is successful, VS2005 will export the following information:

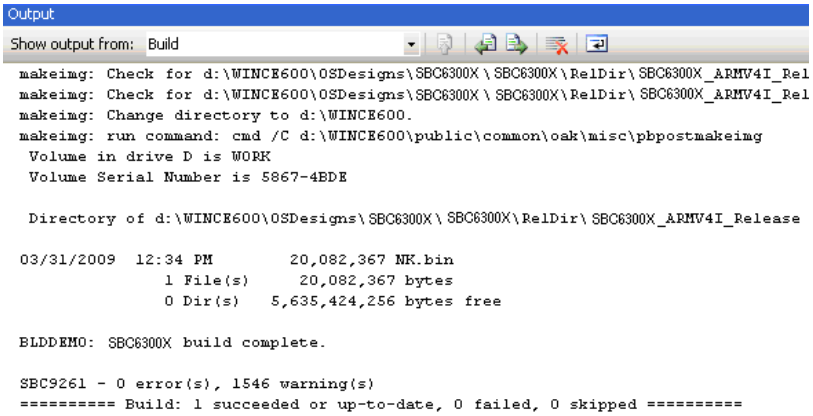

Output
Show output from: Build
makeimg: Check for d:\WINCE600\OSDesigns\SBC6300X\SBC6300X\RelDir\SBC6300X_ARMV4I_Rel
makeimg: Check for d:\WINCE600\OSDesigns\SBC6300X\SBC6300X\RelDir\SBC6300X_ARMV4I_Rel
makeimg: Change directory to d:\WINCE600.
makeimg: run command: cmd /C d:\WINCE600\public\common\oak\misc\pbpostmakeimg
Volume in drive D is WORK
Volume Serial Number is 5867-4BDE
Directory of d:\WINCE600\OSDesigns\SBC6300X\SBC6300X\RelDir\SBC6300X_ARMV4I_Release
03/31/2009 12:34 PM 20,082,367 NK.bin
1 File(s) 20,082,367 bytes
0 Dir(s) 5,635,424,256 bytes free
BLDDEMO: SBC6300X build complete.
SBC9261 - 0 error(s), 1546 warning(s)
========== Build: 1 succeeded or up-to-date, 0 failed, 0 skipped ==========

Figure 46: System Compilation Successful

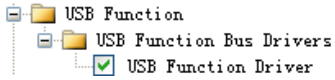
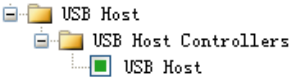
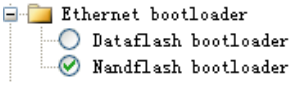
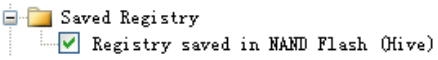
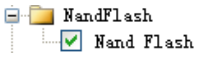
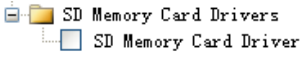
19. The moment 6 WinCE 6.0 image files, i.e.: `FIRSTBOOT.nb0`, `EBOOT.nb0`, `NK.nb0`, `FIRSTBOOT.bin`, `EBOOT.bin`, `NK.bin`, will be generated under the `F:\WINCE600\OSDesigns\SBC6300X\SBC6300X\RelDir\SBC6300X_ARMV4I_Releas\`folder.

5.2 WinCE 6.0 BSP Driver Modules

After the SBC6300X WinCE 6.0 BSP is installed and a project based on the BSP is initially customized following the instructions in Section 0, click `View->Other window->Catalog Items View->SBC6300X->Third Party->SBC6300X:ARMV4I`, you will see the modules of each driver module of the SBC6300X WinCE 6.0 BSP, you can choose them as required. The table below will describe the functions of each module.

Module	Function
ADC ADC	ADC driver.
Audio Audio Driver	AC97 driver.
BSP_EXTUART BSP_EXTUART	SC16C554 serial chip driver..

Module	Function
buzzer buzzer	Buzzer driver.
Display LCDC	Display driver.
Ethernet Ethernet Driver	Ethernet driver.
GPIO GPIO driver	GPIO driver.
I2C I2C (TWI) Driver	I2C driver.
I2C_EEPROM I2C EEPROM Driver	I2C EEPROM driver.
IO IO	IO driver.
Keypad Keypad	IO key driver.
Local Area Networking (LAN) devices Ethernet Driver	DM9000 driver
matrixkey matrixkey	6X6 matrix keyboard driver
PWM PWM Driver	PWM driver.
SDHC SD Host Controller Driver (Bottom Slot) SD Host Controller Driver (Top Slot)	SD card SDIO driver.
Serial Serial Driver	AT91SAM9263 serial driver
TFTLCD TFTLCD 320X240 TFTLCD 480X272 TFTLCD 640X480 TFTLCD 800X480	TFTLCD driver
Touchscreen Touchscreen	Touch screen driver.

Module	Function
	USB device driver.
	USB host driver.
	Bootloader
	Hive registry.
	NAND Flash driver.
	SD card 4 cable SPI driver. Note: SD card SDIO driver and SD card 4 cable SPI driver can only be selected once.

Appendix 1: ESD Precautions & Handling Procedures

Please note that the board comes without any case/box and all components are exposed. Therefore, extra attention must be paid to ESD (electrostatic discharge) precautions. To effectively prevent electrostatic damage, please follow the steps below:

- Avoid carpets in cool, dry areas. Leave development kits in their anti-static packaging until ready to be installed.
- Dissipate static electricity before handling any system components (development kits) by touching a grounded metal object, such as the system unit unpainted metal chassis.
- If possible, use antistatic devices, such as wrist straps and floor mats.
- Always hold an evaluation board by its edges. Avoid touching the contacts and components on the board.
- Take care when connecting or disconnecting cables. A damaged cable can cause a short in the electrical circuit.
- Prevent damage to the connectors by aligning connector pins before you connect the cable. Misaligned connector pins can cause damage to system components at power-on.
- When disconnecting a cable, always pull on the cable connector or strain-relief loop, not on the cable itself.

Warning:

📖 This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Appendix 2: Technical support & Warranty

Embest Technology Co., Ltd. established in March of 2000, is a global provider of embedded hardware and software. Embest aims to help customers reduce time to market with improved quality by providing the most effective total solutions for the embedded industry. In the rapidly growing market of high end embedded systems, Embest provides comprehensive services to specify, develop and produce products and help customers to implement innovative technology and product features. Progressing from prototyping to the final product within a short time frame and thus shortening the time to market, and to achieve the lowest production costs possible. Embest insists on a simple business model: to offer customers high-performance, low-cost products with the best quality and service.

2.1 Technical support service

Embest provides one year of free technical support for all products. The technical support service covers:

- Embest embedded platform products software/hardware materials
- Assistance to customers with regards to compiling and running the source code we offer.
- Troubleshooting problems occurring on embedded software/hardware platforms if users have followed the instructions provided.
- Judge whether a product failure exists.

The situations listed below are not covered by our free technical support service, and Embest will handle the situation at our discretion:

- Customers encounter issues related to software or hardware during their development process
- Issues occur when users compile/run the embedded OS which has been modified by themselves.

- Customers encounter issues related to their own applications.
- Customers experience problems caused by unauthorised alteration of our software source code

2.2 Maintenance service clause

1. Product warranty will commence on the day of sale and last 12 months provided the product is used under normal conditions
2. The following situations are not covered by the warranty, Embest will charge service fees as appropriate:

- Customers fail to provide valid proof of purchase or the product identification tag is damaged, unreadable, altered or inconsistent with the product.
- Products are subject to damage caused by operations inconsistent with their specification;
- Products are subject to damage in either appearance or function due to natural disasters (flood, fire, earthquake, lightning strike or typhoon) or natural aging of components or other force majeure;
- Products are subject to damage in appearance or function due to power failure, external forces, water, animals or foreign materials;
- Products malfunction due to disassembly or alteration of components by customers, or repair by persons or organizations unauthorized by Embest Technology, or alteration from factory specifications, or configured or expanded with components that are not provided or recognized by Embest Technology;
- Product failures due to the software or systems installed by customers, inappropriate software settings or computer viruses;
- Products purchased from unauthorized merchants;
- Embest Technology takes no responsibility for fulfilling any warranty (verbal or written) that is not made by Embest Technology and not included in the scope of our warranty.

3. Within the period of warranty, the cost for sending products to Embest should be paid by the customer. The cost for returning the product to the customer will be paid by Embest. Any returns in either direction occurring after the warranty period has expired should be paid for by the customer.

4. Please contact technical support with any repair requests.

Note:

📖 Embest Technology will not take any responsibility for products returned without the prior permission of the company.

2.3 Basic guidelines for protection and maintenance of LCDs

1. Do not use finger nails or other hard sharp objects to touch the surface of the LCD

2. Embest recommends purchasing specialist wipes to clean the LCD after long time use, avoid cleaning the surface with fingers or hands as this may leave fingerprints or smudges.

3. Do not clean the surface of the screen with unsuitable chemicals

Note:

📖 Embest do not supply a maintenance service for LCDs. We suggest the customer immediately checks the LCD once in receipt of the goods. In the event that the LCD does not run or shows no display, the customer should inform Embest within 7 business days of delivery.

2.4 Value Added Services

We will provide following value added services:

- Driver development based on Embest embedded platforms for devices such as: serial ports, USB interface devices, and LCD screens.
- Control system transplantation, BSP driver development, API software development.
- Other value added services including supply of power adapters and LCD parts.
- Other OEM/ODM services.
- Technical training.

Please contact Embest with any technical support queries:

http://www.embest-tech.com/contact-us.html